

REMARKS

In the Office Action, the Examiner rejected claims 1-4, 7, 12-14, 18, 22-29, 32, 36-45, and 47-56. The claims have been amended to further clarify the subject matter regarded as the invention. The claim rejections are fully traversed below. Claims 1-4, 7, 12-14, 18, 22-29, 32, 36-45, and 47-56 remain pending.

Reconsideration of the application is respectfully requested.

REJECTION OF CLAIMS UNDER 35 USC §103

In the Office Action, the Examiner rejected the claims under 35 USC §103 as being unpatentable over Rai et al, U.S. Patent No. 6,377,982 ('Rai' hereinafter) in view of Short et al, U.S. Patent No. 6,636,894 ('Short' hereinafter). This rejection is fully traversed below in view of the above claim amendments.

As described in the Background section of Applicant's specification, the Mobile IP Management Information Base (MIB) defines a set of variables that can be examined or configured by a manager station. This accounting information is typically stored on the corresponding network device (e.g., Home Agent or Foreign Agent) and therefore each network device may be periodically examined by the manager station. In other words, storage and updating of accounting information is typically dispersed among the network devices rather than stored at a centralized server. Although this information may be periodically polled by the manager station, this process is not dynamically performed (e.g., by a Home Agent or Foreign Agent). Moreover, such variables have not been implemented for the purposes of billing users associated with these mobile nodes. See Background section, pp. 3-4. Accordingly, the lack of centralization of accounting information in a Mobile IP environment typically requires substantial administrative overhead to poll the appropriate network devices (e.g., Home Agents or Foreign Agents).

In accordance with various embodiments of the invention as claimed in claim 1, an accounting request is sent to a centralized server by a network device (e.g., Home Agent or a Foreign Agent) to update accounting information associated with the mobile node. Since this information is centralized, it is possible to generate bills for a mobile node using the accounting information. The cited art, separately or in combination, neither discloses nor suggests the claimed invention. For instance, the cited art neither discloses nor suggests the use of a server that can receive accounting requests from various network devices (e.g., Home Agents and/or Foreign Agents) in order to record accounting information associated with various mobile nodes. Moreover, neither of the cited references, separately or in combination, discloses or suggests the administrative overhead resulting from a distributed system in which accounting information is stored among multiple network devices.

It is important to note that, through the claimed invention, accounting information may be collected as a mobile node roams during a single Mobile IP session. Specifically, as recited in claim 1, the sending of an accounting request by a network device (e.g., Home Agent or Foreign Agent) is performed in response to a trigger event, where the trigger event is a lapse of a predetermined period of time, initiation or termination of a registration of the mobile node, or when a number of packets are received or sent by the mobile node. In other words, the trigger event is independent from the initiation (e.g. logon) or termination (e.g., log off) of a session. Stated another way, the claimed invention enables accounting information to be collected during a session.

The Examiner cites Rai as the primary reference. Specifically, the Examiner cites col. 2, lines 63-67 and col. 3, lines 1-6 and 12-16 of Rai. Rai does disclose a foreign accounting collection module and a home accounting collection module. See col. 2, lines 63-67. Specifically, the home and serving accounting collection modules collect accounting data on message traffic transported between the end system and a communications server. See col. 3, lines 12-17. However, Rai neither discloses nor suggests maintaining accounting information for mobile nodes supported by a plurality of Home Agents. Moreover, Rai neither discloses nor suggests the type of data collected by the accounting collection modules, or the manner in which that information is sent to the accounting server, as claimed. In fact, Rai includes both a foreign accounting collection module and a home accounting collection module. See Abstract. Thus, accounting functions are distributed among multiple locations. As a result,

Rai teaches away from a centralized accounting server that supports a plurality of Home Agents.

The Examiner admits that “Rai fails to teach the trigger event including the counter associated with the mobile node’s activity during a session, the trigger being a lapse of a predetermined period of time and wherein the server is not a Home Agent or a Foreign Agent.” The Examiner seeks to cure the deficiencies of Rai with Short.

It is important to note that Short’s system is not a system operating under the Mobile IP Protocol. While billing may be performed for nodes that are not mobile, such methods may not be easily applied to mobile nodes operating under the Mobile IP Protocol. For instance, billing is often performed through the use of time stamps for nodes that are not mobile. For a node that is not mobile, this method is acceptable since only two time stamps, a START time stamp and a STOP time stamp for a given session, are required to determine a total service time. However, in a Mobile IP environment, each mobile node may roam to numerous Foreign Agents while communicating with a given corresponding node. The Home Agent (or access point) would therefore only see some of the packets associated with a session between the mobile node and the corresponding node. Thus, it may not know exactly when a session starts and stops.

The Examiner asserts that “Short teaches computer network trigger event including the counter, the trigger being a lapse of a predetermined period of time and wherein the server is not a Home agent or a foreign agent,” citing col. 11, lines 51-64. However, Short merely discloses redirection to a portal page upon specific default occurrences, such as a time out, or according to preset time. See col. 11, lines 37-43. The user may customize the information that is provided in the portal page, such as an alarm clock counter to ensure that an appointment is met. See col. 11, lines 43-64. However, there is no mention of a counter associated with a mobile node’s activity during a session. An alarm clock counter cannot be construed to be a counter associated with a mobile node’s activity during a session. As such, the combination of the cited references would fail to operate for the intended purpose (e.g., performing accounting in a Mobile IP environment).

The Examiner further asserts that “Short teaches a system wherein teach a counter that counts a total service time for the mobile node,” citing col. 11, lines 51-64. In fact, the only counter disclosed in col. 11, lines 51-64 of Short is an alarm clock counter, as set forth above. Thus, Short fails to disclose a counter that counts a total service time. In addition, as

set forth above, Short does not disclose a Mobile IP system (e.g., enabling a mobile node to roam while maintaining connectivity to its Home Agent). In fact, Short implies that a user must login from the user's new location (e.g., see col. 8, lines 64-67), rather than allowing a user to maintain connectivity in a previously established connection as the user roams to or from a location. In addition, col. 11, lines 51-64.

Short does disclose that "[t]he portal page may also comprise information related to the status of the current network session. By way of example, this information may include, current billing structure data, the category/level of service that the user has chosen, the bandwidth being provided to the user, the bytes of information currently sent or received, the current status of network connection(s) and the duration of the existing connection(s)." See col. 10, lines 20-27. However, as set forth above, the system disclosed in Short is not a Mobile IP system. In other words, it is unclear how this information would be updated in a Mobile IP system, as claimed. Short does not disclose providing this information in a counter, nor does Short disclose the sending or receiving entities of this counter (e.g., Home Agents, Foreign Agents, etc). Thus, Short fails to disclose or suggest maintaining and updating this information during a Mobile IP session for a Mobile Node. Accordingly, the combination of the cited references would fail to operate for the intended purpose (e.g., to maintain accounting information in a Mobile IP environment).

Moreover, since the admitted prior art and Rai teaches accounting information distributed among Home Agents or Foreign Agents rather than centralized at a server supporting multiple Home Agents, the prior art teaches away from maintaining accounting information for a plurality of Home Agents at a central server as recited in claim 1, for example. Accordingly, the cited art teaches away from the use of a system in which information is centralized at a server (e.g., AAA server) and updated through the use of accounting requests sent by network devices such as Home Agents and Foreign Agents in association with various Mobile Nodes supported by multiple Home Agents.

The claimed invention enables an accounting request to be sent under various circumstances (e.g., after a specific number of packets have been sent or received by a mobile node) where the accounting request includes at least one counter, indicating at least one of a number of packets or bytes sent or received by the mobile node, or a total service time. In this manner, a bill may be generated for this period of time or amount of information transmitted.

The dependent claims depend from one of the independent claims and are therefore patentable over the admitted prior art in view of the cited art for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. Hence, it is submitted that the dependent claims are patentable over the cited art.

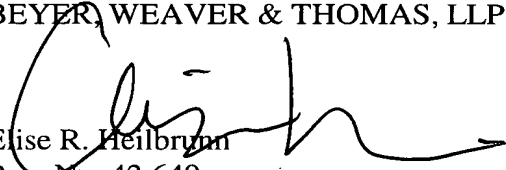
Based on the foregoing, it is submitted that the independent claims are patentable over the cited references. In addition, it is submitted that the dependent claims are also patentable for at least the same reasons. The additional limitations recited in the independent claims or the dependent claims are not further discussed as the above-discussed limitations are clearly sufficient to distinguish the claimed invention from the cited references. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §103(a).

SUMMARY

Reconsideration of the application and an early Notice of Allowance are earnestly solicited. If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. CISCPO77)

Respectfully submitted,
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